

SUPPLEMENT B

PREVIOUS PRISM PLOT DESIGNS AND REMEASUREMENT PROCEDURES

(AR, FL, LA, MS, NC, OK, TX)

REVIEW OF FIELD SAMPLING IN PREVIOUS
SOUTHERN RESEARCH STATION INVENTORY
(AR, LA, MS, OK, TX)

This section is an overview of the previous prism plot design installed by the former Southern Station.

SAMPLE LOCATIONS

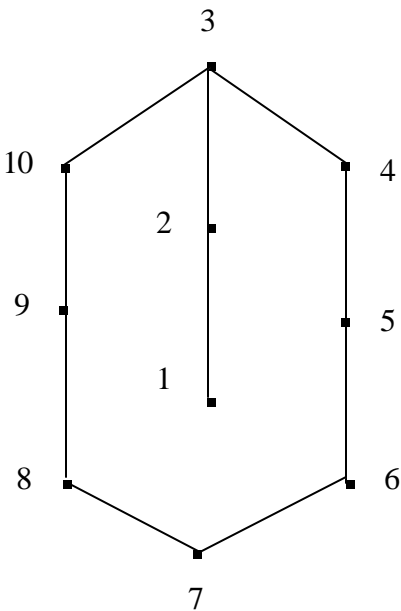
Sample locations were taken at the intersections of a 3-mile grid. At this sampling intensity, a plot location represented approximately 5,760 similar acres. One forest plot location was a cluster of ten points systematically spaced within the boundaries of an acre.

PLOT LAYOUT

The spacing and orientation of the point cluster results in equilateral triangles, with sides 66 feet in length, between points.

10-POINT CLUSTER DESIGN

<u>Azimuth</u>	and	<u>Distance</u>	from	<u>Point</u>	to	<u>Point</u>
000		66 ft		1		2
000		66 ft		2		3
120		66 ft		3		4
180		66 ft		4		5
180		66 ft		5		6
240		66 ft		6		7
300		66 ft		7		8
000		66 ft		8		9
000		66 ft		9		10



At each forested location, ten points were sampled using a 37.5 basal area factor prism to select live trees 5.0 inches DBH and larger. Additionally, all live trees 1.0 through 4.9 inches DBH within a 7.1-foot radius plot were tallied at points 1, 2, and 3. At points 4-10, up to the four most dominant 1.0 to 4.9 inch trees were tallied if fewer than two live variable plot trees were tallied at the point. If there were no live trees or live saplings on any point, then up to the four most dominant seedlings were tallied at the point.

All points were marked with a wire pin. Three witness trees were marked with brass tags and scribed with an "X" at point one. Instructions for plot recovery were recorded. These instructions included a description of the starting point, and the azimuth and distance from the starting point (SP) to plot center (PC), at point 1. All azimuths were measured from magnetic north.

DIAMETER PROCEDURES

Diameters of forked trees were taken 3.5 feet above the crotch intersection on the previous inventory. Diameters will be taken at 3.5 feet above the pith intersection in the current inventory. Record DIAMETER CHECK = 2 for these trees, even if the current diameter is estimated at the new measurement point.

If there was an abnormality at 4.5 ft, then the crew recorded the smallest diameter at a point below 4.5 ft where the diameter was not affected by the abnormality.

ROTATED POINTS

If any point fell in, or within 33 feet of, a non-forest area, the point was rotated into forest land. Rotated points are indicated in the diagram section of the previous inventory plot sheet. When a power line transected the point cluster, points were rotated to the same side as point 1.

PRISM POINT REMEASUREMENT PROCEDURES

This section describes the tree level variables that are recorded when remeasuring both the previous Southern FIA unit's 10-point variable radius plots and the previous Southeastern FIA unit's 5-point variable radius plots.

REMEASUREMENT TALLY

All trees 1.0 inch and larger on the previous inventory will be accounted for on prism points 1 through 3. Only those trees that were 5.0 inches or larger last inventory are remeasured on prism points 4 and 5. Additionally, trees within the 6.8-foot radius on prism points 1 through 3 that were less than 1.0 inch at the last inventory and have now grown to 5.0 inches or larger are recorded as through growth trees. Otherwise, never remeasure trees that were less than 1.0 inch at the previous survey.

NOTE: The previous Southern station measured all saplings within a 7.1-foot radius plot at all points. Ignore all saplings on points 4-5. Check all previous distances on saplings that were recorded between 6.8 and 7.1 feet. Only remeasure the saplings that are within a 6.8-foot radius on prism points 1-3. If a sapling was recorded within 6.8 feet at the last survey and now is beyond 6.8 feet, then code PRISM TREE STATUS = 0. Ignore any sapling measured beyond 6.8 feet in both the previous and current inventory.

Trees that are on both the old prism plot and the new mapped plot are tallied as a single tree entry. Record all required items listed here as well as all required mapped tree level variables for trees that are common to both plots (see Section 5.0).

DATA RECORDED

Record the following tree level variables on prism point trees:

ITEM R501 ENTRY NUMBER
ITEM R508 PRISM POINT#/TREE#
ITEM R509 PRISM TREE STATUS
ITEM 5061 NEW TREE RECONCILE
ITEM 5080 SPECIES
ITEM 5092 CURRENT DIAMETER AT BREAST HEIGHT (DBH)
ITEM 5091 PREVIOUS DIAMETER AT BREAST HEIGHT
ITEM 5100 DIAMETER CHECK
ITEM 5230 LENGTH TO DIAMETER MEASUREMENT POINT
ITEM R503 TREE CLASS
ITEM 5110 PERCENT ROTTEN/MISSING CULL
ITEM 5120 TOTAL LENGTH
ITEM 5130 ACTUAL LENGTH
ITEM 5140 LENGTH METHOD
ITEM 5190 CAUSE OF DEATH
ITEM 5200 MORTALITY/NONFOREST YEAR
ITEM 5220 UTILIZATION CLASS
ITEM 5260 TREE NOTES

ITEM R501 ENTRY NUMBER

The entry number is pre-printed on tally sheets and is automatically created in Excel. If an entry is crossed out or omitted for any reason subsequent entry numbers must be manually renumbered.

When collected: All tally trees and entries to label no tally on sub/microplot
Field width: 3 digits
Values: 001 to 999

ITEM R508 PRISM POINT#/TREE #

Record the 1 digit point number and the unique 2-digit tree number that was recorded in the previous survey. Never change the old point number or old tree number. Record the point number and two zeros for the tree number when there are no remeasurement trees on a prism point. Use the next available tree number when assigning new numbers to missed and volume ingrowth trees. Also, record the point#/tree#, azimuth and distance of missed and volume ingrowth trees in the Tree Notes item for check cruise purposes.

When collected: All remeasurement tally; entry to record no tally on prism point
Field width: 3 digits
Values: 100-599

ITEM 5040 AZIMUTH

If a tree is on both the mapped and prism plots, then record the azimuth from the subplot center for trees 5.0 inches DBH or larger, or from the off-set microplot center for saplings, to the center of the base of the tree. Record the azimuth to the nearest degree. Use 360 for due north. In the Tree Notes item, record the azimuth from the prism point to the center of the base of the tree, **only** on prism plot trees that are missed or through trees, or if the past azimuth is off by more than 10 degrees, for check cruise purposes. Azimuth is not required on trees that are only on the prism plot.

When collected: Remeasurement tally on **both** mapped and prism plots
Field width: 3 digits
Values: 001-360

ITEM 5050 HORIZONTAL DISTANCE

If a tree is on both the mapped and prism plots, then record the horizontal distance from the subplot center for trees 5.0 inches DBH or larger, or from the off-set microplot center for saplings, to the pith of the tree at the base. Record the distance to the nearest one-tenth foot. In the Tree Notes item, record the distance from the prism point to the center of the base of the tree, **only** on prism plot trees that are missed or through growth trees, or if the past distance is off by more than 5 feet, for check cruise purposes. Otherwise dash this item for a tree that is only on the prism plot.

When collected: Remeasurement tally on **both** mapped and prism plots
Field width: 3 digits
Values: 000-999

ITEM R509 PRISM TREE STATUS

Record a PRISM TREE STATUS for each prism point tree; this code is used to track the status of sample trees over time. This information is needed to correctly assign volume information to the proper component of volume change.

Note: For any prism point tree that is now on the new mapped plot, crews must collect new azimuth and distance information from the subplot center (for trees) or the off-set microplot center (for saplings).

When Collected: All previously tallied trees, through growth trees, and missed trees

Field width: 1 digit

Values:

- 0 No status -- tree is not presently in the sample. Tree was incorrectly tallied at the previous survey or currently is not tallied due to definition or procedural change.
- 1 Live tree – any live tree on accessible forest land (remeasured, through growth, or missed)
- 2 Dead tree -- any dead tree (remeasured, through growth, or missed), regardless of cause of death, which does not qualify as a removal.
- 3 Removal - a prism tree that has been removed from forestland. Includes any prism tree cut or killed by direct human activity related to harvesting, silviculture or land clearing. The tree may, or may not, have been used. Only code trees killed by fire as removals if it was a prescribed burn. Also includes live remeasured prism trees that are in a nonforest area.
- 4 Missing – tree was tallied in previous inventory but now is missing due to natural causes such as landslide, fire, etc. (remeasurement plots only).

ITEM 5061 NEW TREE RECONCILE (CORE 5.6.1)

Record a NEW TREE RECONCILE for new tally trees on the prism plot that were less than 1.0 inch on the previous inventory and now are 5.0 inches or greater, or for any tree that was missed on the last inventory. Be wary of recording missed trees. Unless it is obvious that the previous cruiser was in error, give the benefit of the doubt.

When Collected: On SAMPLE KIND 9; all missed live tally trees = 1.0 inch DBH and through growth tally trees.

Field width: 1 digit

Values:

- 2 Through growth – new tally tree 5 inches DBH and larger, within the **remeasured** 6.8-ft radius microplot.
- 3 Missed live – a live tree missed at previous inventory and that is live, dead or removed now. Also use this code to account for trees that were not tallied at the previous inventory, but are now due to any procedural changes (DBH rule changes, forking rule changes, etc.)

ITEM 5080 SPECIES

Record the appropriate SPECIES code from the list in Appendix 3. If you encounter a species not listed in Appendix 3 and are not sure if it should be tallied as a tree, consult your Field Supervisor. If the species cannot be determined in the field, tally the tree, but bring branch samples, foliage, cones, flowers, bark, etc. to your supervisor for identification. If possible, collect samples outside the subplots from similar specimens and make a note to correct the SPECIES code later. Use code 299 for unknown dead conifers and 999 for unknown dead hardwood when the generic or species codes cannot be used. The generic code (e.g., 400, 540) should only be used when you are sure the species is on the species list, but you cannot differentiate among acceptable species. In this case use the sample collections procedures described above.

When collected: All remeasurement tally
Field width: 3 digits
Values: See Appendix 3

ITEM 5092 CURRENT DIAMETER AT BREAST HEIGHT (DBH) (CORE 5.09.2)

Unless one of the special situations described in Appendix 3 is encountered, measure DBH at 4.5 ft above the ground line on the uphill side of the tree. Round each measurement down to the last 0.1 inch. For example, a reading of 3.68 inches is recorded as 3.6 inches.

When Collected: All live tally trees \geq 1.0 in DBH (TREE STATUS 1)
Field width: 3 digits (xx.y)
Values: 010 to 999

ITEM 5091 PREVIOUS DIAMETER AT BREAST HEIGHT (CORE 5.09.1)

This is the DBH assigned at the previous survey. It has been downloaded from the previous inventory onto the data recorder and/or on hardcopy.

When collected: All remeasurement tally trees
Field width: 3 digits (xx.y)
Values: 010 to 999

ITEM 5100 DIAMETER CHECK (CORE 5.10)

Record this code to identify any irregularities in diameter measurement positions (e.g., abnormal swellings, diseases, damage, new measurement positions, etc.) that may affect use of this tree in diameter growth/change analyses. Use code 2 for remeasurement trees only.

Note: If both codes 1 and 2 apply, use code 2.

When Collected: All live (TREE STATUS 1) tally trees \geq 1.0 in DBH
Field width: 1 digit
Values:

- 0 Diameter measured accurately
- 1 Diameter estimated, or tree shrunk due to bark slough by less than 0.2 inch

- 2
- Diameter measured at different location than previous measurement; the previous diameter was estimated and the current diameter is measured accurately; previous diameter is obviously incorrect; or the tree shrunk by 0.2 inch or more

ITEM 5230 LENGTH TO DIAMETER MEASUREMENT POINT (CORE 5.23)

For those trees measured directly at 4.5 ft above the ground, leave this item blank. If the diameter is not measured at 4.5 ft, record the actual height from the ground, to the nearest 0.1 in, at which the diameter was measured for each tally tree, 1.0 in DBH and larger.

When Collected: All live (TREE STATUS 1) and dead tally trees \geq 1.0 in
Field width: 3 digits (xx.y)
Values: 001 – 150

ITEM R503 TREE CLASS

Record the code that indicates the tree class. All palmetto species are coded TREE CLASS 3.

When Collected: All live tally trees \geq 1.0 in DBH (TREE STATUS 1), all mortality trees \geq 5.0 in DBH
Field width: 1 digit
Values:

2	Growing stock
3	Rough cull
4	Rotten cull

ITEM 5110 PERCENT ROTTEN/MISSING CULL (CORE 5.11)

Record the percentage of rotten and missing cubic-foot cull volume, to the nearest 1 percent. When estimating volume loss (tree cull), only consider the cull on the merchantable bole/portion of the tree, from a 1-ft stump to a 4-inch top. Do not include any cull estimate above actual length. See Appendix 3 for complete procedures and cubic foot volume table.

When Collected: All live tally trees (TREE STATUS 1) \geq 5.0 in DBH, all mortality trees \geq 5.0 in DBH
Field width: 2 digits
Values: 00 to 99

ITEM 5120 TOTAL LENGTH (CORE 5.12)

Record the TOTAL LENGTH of the tree, to the nearest 1.0 ft from ground level to the tip of the apical meristem. For trees growing on a slope, measure on the uphill side of the tree. If the tree has a broken or missing top, estimate what the total length would be if there were no missing or broken top. Forked trees should be treated the same as unforked trees, measure the tallest stem.

When Collected: All live tally trees (TREE STATUS 1) \geq 1.0 in DBH

Field width: 3 digits

Values: 005 to 400

ITEM 5130 ACTUAL LENGTH (CORE 5.13)

For trees with broken or missing tops. Record the ACTUAL LENGTH of the tree to the nearest 1.0 ft from ground level to the highest remaining portion of the tree still present and attached to the bole. Use the length to the break for ACTUAL LENGTH until a new leader qualifies as the new top for TOTAL LENGTH; until that occurs, continue to record ACTUAL LENGTH to the break. If the top is intact, this item may be omitted on live trees. Forked trees should be treated the same as unforked trees, measure the tallest stem. Trees with previously broken tops are considered recovered (i.e., ACTUAL LENGTH = TOTAL LENGTH) when a new leader is 1/3 the diameter of the broken top at the point where the top was broken (not where the new leader originates from the trunk).

When Collected: All live tally trees (TREE STATUS 1) \geq 1.0 in DBH

Field width: 3 digits

Values: 005 to 400

ITEM 5140 LENGTH METHOD (CORE 5.14)

Record the code that indicates the method used to determine tree lengths.

When Collected: All live tally trees (TREE STATUS 1) \geq 1.0 in DBH

Field width: 1 digit

Values:

- 1 Total and actual lengths are field measured with a measurement instrument (e.g., clinometer, relascope, tape)
- 2 Total length is visually estimated, actual length is measured with an instrument
- 3 Total and actual lengths are visually estimated

ITEM 5190 CAUSE OF DEATH (CORE 5.19)

Record a cause of death for all trees that have died, been cut since the previous survey. If cause of death cannot be reliably estimated, record unknown/not sure.

When Collected: All PAST TREE STATUS = 1 and PRESENT TREE STATUS = 2 - 3

Field width: 2 digits

Values:

10	Insect	80	Human
20	Disease	81	Landcleared – alive (prism trees ONLY)
30	Fire	82	Landcleared – dead (prism trees ONLY)
40	Animal	83	Lancleared - cut (prism trees ONLY)
50	Weather		
60	Vegetation (suppression, competition, vines/kudzu)		
70	Unknown/not sure/other	90	Physical (hit by falling tree)

ITEM 5200 MORTALITY YEAR (CORE 5.20)

Record the estimated year that remeasured trees died or were cut. For each remeasured tree that has died or been cut since the previous inventory, record the 4-digit year in which the tree died. Mortality year is also recorded for trees on land that has been converted to a nonforest land use, if it can be determined that a tree died before the land was converted.

When Collected: All PAST TREE STATUS = 1 and PRESENT TREE STATUS = 2 - 3

Field width: 4 digits

Values: 19xx or higher

ITEM 5220 UTILIZATION CLASS (CORE 5.22)

Record the code to identify cut trees that have been removed from the site.

When Collected: All TREE STATUS = 3 or TREE STATUS = 2 and tree has been cut (salvaged mortality)

Field width: 2 digits

Values:

- 00 Not utilized - can still be found on the site, or, if not actually found on the site, the cruiser estimates that due to past DBH, species, or from other information, that the tree was not removed from the site for use as a product, either commercially or non-commercially.
- 11 Commercial utilization – some portion of the tree removed for commercial purposes. Commercial uses include sawlogs, pulpwood, veneer logs, poles, and other products such as firewood cut by commercial firewood operations.
- 12 Non-commercial utilization – some portion of the tree removed for non-commercial purposes. Non-commercial uses include domestic firewood use, barn poles, fence posts, domestic landscaping, rough slabs, etc.

Trees that have been cut above 4.5 ft (“jump-butt”) due to a fence or defect, are tallied if still standing at 4.5 ft. If the tree is still alive at DBH, then record TREE STATUS = 1 and then record UTILIZATION = 11 or 12. If it is dead at DBH, then record PRISM TREE STATUS = 3 and UTILIZATION = 11 or 12. However, this does NOT apply to naturally swell butted trees where it is normal to cut above 4.5’. Continue to code those trees as removals (TREE STATUS 3) if cut below the diameter point and then code UTILIZATION = 11 or 12.

ITEM 5260 TREE NOTES (CORE 5.26)

Record notes pertaining to an individual tree as called for to explain or describe another variable.

When collected: All live and dead tally trees

Field width: Alphanumeric character field

Values: English language words, phrases and numbers

**REVIEW OF FIELD SAMPLING IN PREVIOUS
SOUTHEASTERN RESEARCH STATION INVENTORY
(FL, NC)**

This section is an overview of the previous prism plot design installed by the former Southeastern Station.

SAMPLE LOCATIONS

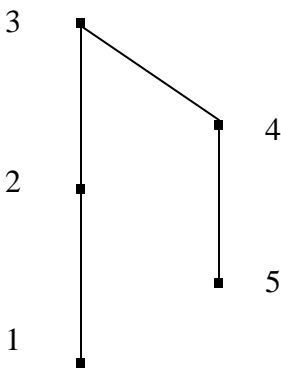
Sample locations were located randomly on aerial photography. One forest plot location was a cluster of 5 points.

At each location determined to meet the definitions for forestland, five points were sampled using a 37.5 basal area factor to sample live trees 5.0 inches diameter at breast height (DBH) and larger. Additionally, all live trees 1.0 through 4.9 inches DBH within a 6.8 ft radius plot were measured at each sample point.

PLOT LAYOUT

The standard plot layout was:

5-POINT CLUSTER DESIGN						
<u>Azimuth</u>	<u>and</u>	<u>Distance</u>	<u>from</u>	<u>Point</u>	<u>to</u>	<u>Point</u>
000		70 ft		1		2
000		70 ft		2		3
120		70 ft		3		4
180		70 ft		4		5

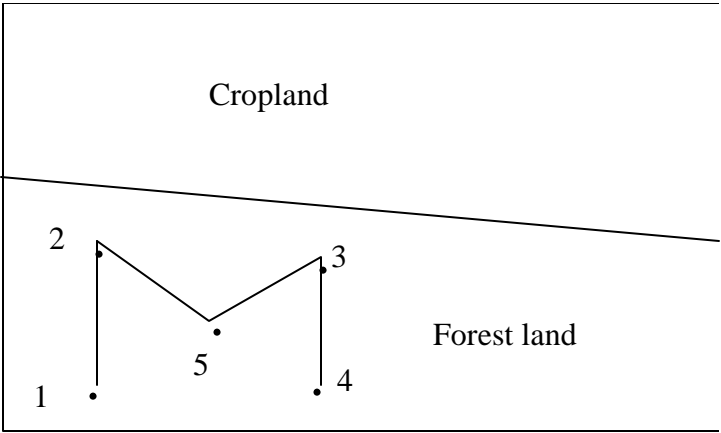


All points were marked with a wire pin. Two witness trees were marked with aluminum tags and scribed with a “T” at point one. One witness tree may be scribed with a double slash (“\\”). Instructions for plot recovery were recorded on the back of the old tally sheets. These instructions included a description of the starting point, and the azimuth and distance from the starting point (SP) to plot center (PC), at point 1. All azimuths were measured from magnetic north.

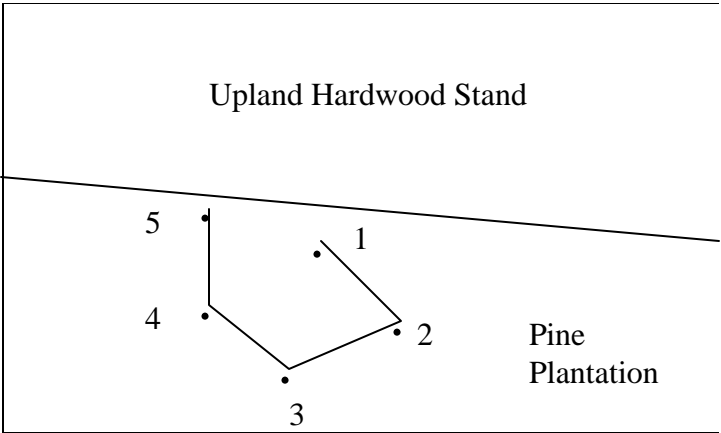
SAMPLING ONE CONDITION

Where point 1, or plot center sampled a forestland use, all points were confined to a single forest condition within forestland. The distinct characteristics that existed on point 1, or plot center, served as the basis for installing the remaining points in the same land use or forest condition. If point 1, or plot center, sampled an area that was defined as a non-forest land use, then the entire plot was classified as non-forest land and no other points were installed. A procedure was used to rotate points in an unbiased manner for those points where point 1 was classified as forestland. If points were rotated, it will be indicated in the diagram section on the previous inventory plot sheet.

Illustrations of different situations that will commonly be encountered:

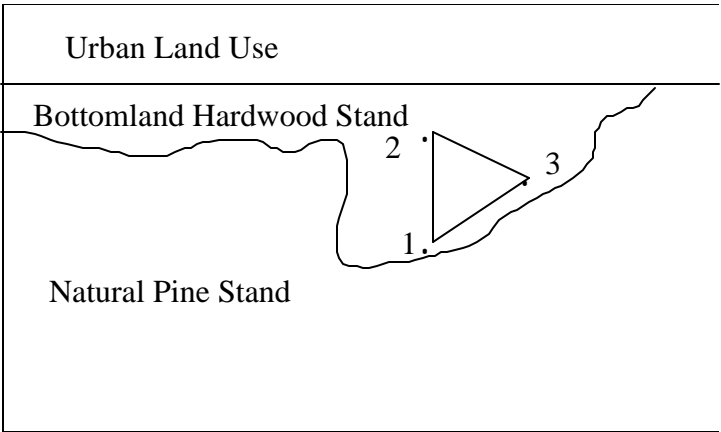


Example 1: Point 1 sampled an area defined as forestland. Points 3 and 4 were rotated into the forestland.



Example 2: Point 1 sampled an area defined as forestland and also sampled a pine plantation. Points 2-5 were rotated from the standard layout so that they fell entirely within the pine plantation.

In certain situations, less than 5 inventory points were installed. If all 5 points could not be installed within a single forest condition using the standard substitution procedure, then the sample was modified by installing as many points as possible. A minimum of 3 points could be established. Example 3 is a situation where less than 5 points were installed.



Example 3: Inventory points were also rotated if the point fell less than 15 feet from an adjacent forest condition or land use. Points were also rotated if a tree was tallied from an adjacent forest condition. In some cases, because of errors made by previous field crews, the points may not be in the exact location. The distance between points may be wrong, the azimuth between points may be wrong, or the diagram on the previous tally sheet may be wrong. Every attempt should be made to locate the previous inventory point.